

AMENDMENTS AND REMARKS

This responds to the Office Action mailed June 21, 2005 in connection with the above identified patent application. Prior to entry of this amendment, claims 1-20 were pending in the application.

By this amendment, claims 1-4, 7-11 and 13-20 have been amended. New claims 21 and 22 have been added. It is to be noted that in amending the claims no new matter has been introduced, since they contain only limitations that were disclosed in the original claims.

Claim objections

The claims were objected to for containing grammatical and idiomatic inconsistencies.

The claims have been accordingly corrected to overcome such objection.

Claim Rejection - 35 U.S.C. 112

Claim 1 was objected to for lack of antecedent bases.

The limitation "the machine" has been changed into "the machine tool", introduced in line 1. The limitation "the output side" has been changed into "an output side".

Claim Rejection - 35 U.S.C. 102 and 103

Claims 1, 4, 5, 9, 11 and 12 were rejected under 35 USC 102(b) as being anticipated by Brainard et al.

Claims 2, 3, 6, 7, 8, 10 and 13-20 were rejected under 35 USC 103(a) as being unpatentable over Brainard et al. in view of Kerry et al.

The Examiner's position is respectfully traversed.

Present claim 1 is clearly not anticipated by Brainard. Indeed, Brainard does not disclose a spindle movable in the three-dimensional space along three axes (X, Y, Z), as required by original claim 1. Rather, the spindle of Brainard moves only in a plane along two axes (X, Y).

Furthermore, Brainard does not disclose or suggest that its means for emitting electromagnetic signals are located externally of the machine tool, as also required by original claim 1. Rather, the emitting means of Brainard (laser 88, figure 4) is carried by the outer tubular member 70 belonging to rectilinear measuring transducer 28 (figures 1 and 4) mounted in the machine tool. As Brainard recites at column 4, lines 2 and 3, "the machine tool there shown incorporates measuring transducers means".

Finally, Brainard does not disclose or suggest that its means for receiving the electromagnetic signals (photodetectors 109 and 110, figure 4) are installed on the spindle, as required by original claim 1. Rather, the photodetectors 109 and 110 are secured to the prismatic element 85 (figure 4) which, as clearly shown in figure 2 of Brainard, is not mounted on the spindle, and in fact is mounted a substantial distance from the spindle.

Present claim 1 is also non-obvious over the cited art. The differentiating features of present claim 1 with respect to Brainard allows the solution of a technical problem originally presented in the specification, namely, to provide a device for checking the position of the spindle in the space which is not affected by the errors due to the variation of the geometry of the structure of the machine tool.

Such a problem is not faced by Brainard because it uses transducers (tubular members 27, 28) linked to the structure of the machine tool and subject themselves to deformations (i.e. thermal deformations).

Such a problem is also not faced by Kerry because there is no reference to a machine tool.

Furthermore, Kerry does not disclose that the object to be detected (comparable to the spindle of the present invention) is provided with means for receiving the electromagnetic signals. Rather, the apparatus of Kerry is provided with means for receiving, at a plurality of spaced apart locations, the probe signal as returned by the object (column 3, lines 23-25).

Hence, even if the combination of Brainard with Kerry were attempted it would not lead to the claimed solution.

New claim 21 comprises the subject matter of original claims 1 and 11. New claim 22 comprises subject matter of claim 1 and claim 11 but also omits certain subject matter of claim 1. Such an embodiment is provided with means 30 on fixture 18 for detecting the position of the piece to be machined. See page 4, lines 16-17 and pages 10-11 of the specification.

Brainard does not disclose or suggest that its fixture serving to support a part to be machined (worktable 75 of figure 2) comprises a set of receiving means for picking up the electromagnetic signals from the emitting means. Indeed, Brainard does not disclose or suggest any device for checking the position of the piece to be machined.

In addition, claims 21 and 22 both require that the "receiving means for picking up the electromagnetic signals from the emitting means" is "connected to means for processing and outputting signals indicating the distance between each of the emitting means and the receiving means." This allows the precise determination of the position of the piece to be worked so that appropriate compensation can be made in the machining process should there be movement of the piece to be worked, such as by thermal expansion. See page 10, lines 7-25.

Such a feature is not disclosed or suggested by Brainard or Kerry. Therefore, even the combination of such documents would not lead to the claimed solution.

For these reasons, claims 21 and 22 are new and non-obvious over the cited art.

New claim 21 is also new and non-obvious over the cited art for the same reasons explained above with respect to claim 1.

Therefore, independent claims 1, 21 and 22 are believed to be patentable since they are new and non-obvious over the cited prior art.

Claims 2 to 20 depending from patentable claim 1 are believed to be patentable for the same reasons as given with respect to claim 1, as well as for the further limitations contained therein.

Conclusion

All matters having been addressed above and in view of the pending claims and remarks, Applicant respectfully requests the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

Applicants' counsel remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this application.

Respectfully submitted,

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